National Institutes of Health

The Advisory Committee to the Director Working Group on Diversity

Racism in Science Report*

February 14, 2021

***This report was developed based on deliberations of the Advisory Committee to the Director Working Group on Diversity (ACD WGD) during the summer of 2020. Since that time, there have been changes in the NIH landscape and beyond. However, the principles enunciated remain applicable. The ACD WGD will provide an update to this report at a future convening of the ACD.**

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Executive Summary

Racism is a dark yet prevalent aspect of life in the United States. It has unfortunately shaped many systems and standards in our country, such as health care, employment, housing, income, and job opportunities, creating countless inequities for underrepresented groups (URGs), which include racial and ethnic minorities, women, individuals with disabilities or underlying health conditions, and individuals from disadvantaged backgrounds.[*] Systemic racism in the United States has particularly affected Black people. The ongoing coronavirus disease 2019 (COVID-19) pandemic and several recent high-profile incidents of police brutality against Black people have elevated the visibility of America's many issues relating to systemic racism and inequity. These events have led to a call for a variety of institutions to assess and address behaviors and practices that contribute to structural and cultural racism. The scientific workforce has not been immune from the effects of systemic racism and inequity: there is strong evidence that Black members of the scientific workforce have more difficulties being hired for faculty positions, securing funding, and dealing with the demands of working in environments with low diversity. These difficulties can ultimately affect their success and retention in the scientific workforce.

This report provides suggestions by the Advisory Committee to the Director Working Group on Diversity, developed during the summer of 2020, about how the National Institutes of Health (NIH) can address racism in the scientific workforce and improve diversity, equity, and inclusion (DEI) efforts. The first step is acknowledging racism and inequity in the scientific workforce and thereby indicating support for Black and other members of URGs in the scientific community. Next, the scientific community needs to use its strengths and conduct evidence-based research to better understand racism in the workforce and develop and evaluate interventions. Institutions need to closely monitor acts of racial discrimination and address them consistently and seriously. Institutions should also implement a variety of evidence-based DEI trainings. While the scientific community should focus on efforts to promote individual-level awareness and change regarding systemic racism, there also needs to be a significant effort to create institutional and cultural change. The focus should be on addressing recruitment, hiring, admission, retention, training, and funding processes and policies that negatively affect Black individuals and other people from URGs. The scientific community needs to make a strong and expedited commitment to addressing racism in order to create lasting change.

Theme	**Suggestions**
Acknowledge Racism and Inequity and Provide Support to Black Members of the Scientific Community	• Acknowledge the prevalence of racism and anti-Blackness in the scientific workforce • Openly discuss the impact of systemic racism and inequity on Black scientists • Present research with honest and precise language about racial and ethnic disparities • Provide personal- and institutional-level support for Black members of the scientific community

[*]Notice of NIH's Interest in Diversity (NOT-OD-20-031)

Theme	Suggestions
Conduct Research to Understand Systemic Racism in Research Studies and the Scientific Workforce	• Research potential interventions to address systemic racism in research studies and the scientific workforce • Leverage cross-disciplinary and community-based research to enhance the diversity of researchers and participants • Increase funding for health disparity and community-based research • Update funding applications to include criteria for external validity and best practices for enhancing diversity
Monitor Acts of Racial Bias and Change the Culture Surrounding Diversity, Equity, and Inclusion	• Identify institutional practices that bolster systemic racism and implement changes • Monitor incidents of racial discrimination at institutions to ensure progress and lasting change • Encourage scientific community members and others at NIH-funded institutions to report incidents of bias and mistreatment (via periodic climate surveys, real-time reporting, etc.) • Implement targeted trainings and behavioral interventions to combat implicit bias • Empower scientific community members to be allies to colleagues from URGs by actively combatting racial discrimination
Make Structural Changes to Mitigate the Impact of Racism and Implicit Bias in the Scientific Workforce	• Create and enhance training and career pathway programs that encourage students from URGs to pursue degrees and jobs in science, technology, engineering, and mathematics (STEM) • Create incentives for institutions to enhance representation and diversity through training programs and community-based partnerships • Implement trainings and standards for admissions and hiring committees to mitigate the impact of racism and implicit bias • Create annual DEI reporting requirements for researchers and institutions funded by NIH

Introduction

Racism is an enduring issue in the United States. While there are people who have racist beliefs, whether malicious or unintentional, racism is embedded in many local and national systems, such as health care, education, income, and criminal justice.[1] Systemic racism has created many inequities for people from underrepresented groups (URGs), especially Black people, and the events of 2020 have led to a renewed call to address racism in all facets of American life. The coronavirus disease 2019 (COVID-19) pandemic has severely impacted racial and ethnic minorities in the United States, with the highest death tolls due to COVID-19 among Black populations.[2-4] Black people are more likely to have underlying conditions, and there are historical systemic issues that have contributed to these disparities in infection, hospitalization, and death rates among Black people due to COVID-19.[5-7] For example, Black people are more likely to have essential jobs, such as grocery store or warehouse workers, rely on public transportation, and live in poor, crowded housing conditions, all of which increase the risk for being exposed to COVID-19.[5, 7] Additionally, recent events of police brutality directed at Black Americans have accentuated the depth of individual and systemic racism in our country. While police brutality against Black people is not novel, there have been several high-profile incidents of police violence that have sparked protests and calls for reform.

The colliding events of the COVID-19 pandemic and ongoing police brutality have caused many appeals for institutions to re-evaluate how their practices and beliefs contribute to systemic racism and discrimination. These inequities are well-established in many institutions, including the broader scientific workforce. Many members of the scientific community have called for change to better support Black scientists and enhance diversity.[8-11] Within the scientific workforce, there are pervasive inequities, such as discriminatory recruiting and hiring practices, the lack of diversity, fewer funding and promotion opportunities for researchers from URGs, and embedded discrimination in the scientific research process. Each of these issues have contributed to a culture of racism and created challenges for members of the scientific workforce from URGs.

The National Institutes of Health (NIH) has long recognized the importance of diversity in the biomedical and behavioral research workforce. The Advisory Committee to the Director (ACD) Working Group on Diversity (WGD) is a permanent working group of the ACD that has been charged with providing regular advice to the ACD, which in turn advises the NIH Director on effective strategies to enhance diversity. These include efforts to improve the representation of URGs in the research workforce and to reduce disparities in research awards to applicants from URGs.[†] In response to revitalized calls for people and institutions to address racism in the United States, the ACD WGD reflected on its impact in the scientific workforce. This report provides the ACD WGD's suggestions about how NIH can address these issues and promote systemic change. The evidence and suggestions presented in this report are based on presentations and discussions during ACD WGD meetings on June 10 and August 11, 2020, and members' written responses to questions about these issues. This report can be used to influence the immediate and long-term actions of NIH and the scientific community to provide support to Black and other historically underrepresented racial and ethnic minority members of the scientific workforce, implement new initiatives, and elicit fundamental change.

[†] NIH awards are made to institutions, but for the purposes of this report, the terms "applications" and "awards" refer to those senior and key personnel on applications and/or awards, respectively.

Racism in the Scientific Workforce

There is strong evidence that individuals from URGs face many challenges when finding jobs and excelling in their careers, including in the scientific workforce. Despite improvements in recent years, the representation of people from URGs at the undergraduate, graduate, postdoctoral, and faculty levels remains significantly lower than in the U.S. population. This lack of diversity can negatively affect the ability of individuals from URGs to be admitted into a graduate program or receive postdoctoral or faculty positions. Similar disparities exist in NIH funding of scientists from URGs; although the number of trainees from URGs receiving NIH funding has increased in recent years, these numbers are still deficient. This lack of funding can negatively affect an investigator's research, hinder their career progress, and affect their retention in the workforce. Although NIH is dedicated to supporting all researchers from URGs, recent events have highlighted the deeply rooted systemic racism against Black people in particular, emphasizing the need to address challenges for Black scientists in the scientific workforce.

Racial and Ethnic Composition of the Scientific Workforce

Although efforts by NIH and other institutions to promote diversity have led to a steady increase in the number of students from URGs who receive bachelor's and doctorate degrees in science and engineering, the demographics of the scientific workforce do not reflect the racial and ethnic diversity in the United States.[12, 13] Between 2012 and 2017, the number of Black doctoral recipients rose by almost 29%.[14] Despite this increase, only 22% of all science and engineering bachelor's degrees and 9% of all doctorate degrees were earned by students from URGs, even though people from URGs represented approximately one third of the U.S. population.[12] In 2016, Black men and women made up 4% and 7%, respectively, of the graduate student population in science and engineering programs.[12] Within the scientific workforce, Black scientists represented only 7.7% of the full-time scientists, even though Black people represent 13% of the U.S. population.[12] The lack of diversity in the scientific workforce could discourage individuals from URGs from pursuing a science degree or a faculty position and create a negative culture for current scientific workforce members from URGs. Faculty from URGs have reported feeling isolated or excluded since few or none of their colleagues look like them.[13, 15] This lack of belonging among faculty from URGs can negatively impact personal well-being and professional opportunities, such as collaborations.[15] This may be exacerbated for people who sit at the intersection of multiple marginalized communities.

NIH Funding Disparities for Racial and Ethnic Minority Investigators

NIH funding data provide interesting insights into the challenges faced by graduate students, postdoctoral fellows, and faculty from URGs. The percentage of trainees from URGs who are supported by fellowship (F) and training (T) awards has risen between 2012 and 2018: T awards to trainees from URGs increased from 12% to 20%, and F awards increased from 10% to 14%. Despite this increase, the funding of scientists from URGs—specifically Black scientists—remains alarmingly low. For NIH training awards, only 10% of predoctoral awards (F30/F31) and 8% of postdoctoral awards (F32/T32) go to senior and key personnel from URGs. Furthermore, only 1% of predoctoral awards and 1% of postdoctoral awards go to Black applicants. Notably, NIH has effectively closed the gap for research career development awards, or K awards, which support researchers at various stages in their career.[16] Between 2013 and 2018, the percentage of Black K awardees increased from 22% to 34%, while the

percentage of white K awardees increased from 34% to 37%.[16] NIH must close the gap between Black and white researchers in other grant programs.

R01 awards are the most widely used investigator-initiated research project grants.[17] They are essential for researchers to support their work and achieve independence as investigators. There is significant evidence that Black researchers have a lower probability of being awarded R01 funding.[17-20] Between 2000 and 2006, the success rate for R01 funding among white applicants was 29.3%, whereas the success rate among Black applicants was 17.1%.[17] When data were disaggregated based on race and gender, Black women were the least likely to receive R01 awards.[18] R01 applications from Black researchers received worse overall impact scores than applications from white researchers and were less likely to be funded.[21] A recent study analyzed the steps of the NIH application and funding process and attributed the funding gap for Black scientists to the proposed topics in their applications.[20] Black scientists are more likely to propose research on topics focused on community- and population-level research, topics that have lower award rates compared with more fundamental and mechanistic research.[20] NIH has launched a variety of efforts to address these funding disparities, including the National Research Mentoring Network (NRMN) and the Building Infrastructure Leading to Diversity (BUILD) initiative within the Diversity Program Consortium (DPC). There have been some improvements in funding rates for Black researchers over time. Between 2013 and 2018, the number of R01 grants awarded to Black researchers increased by 117%; however, in 2018, only 2% of all R01 grants were awarded to Black researchers.[‡] More concerted efforts are needed to address the funding gaps for Black scientists.

Additional Professional Challenges for Racial and Ethnic Minorities in the Scientific Workforce

In addition to the lack of diversity in the scientific workforce and funding gaps, there are larger cultural issues within the scientific workforce that create challenges for researchers from URGs, particularly Black researchers. There are certainly structural issues with the faculty hiring process. For example, a study found that doctorates who graduate from prestigious universities are more likely to be hired for faculty positions and receive more influential positions at an institution.[22] The Carnegie Classification® is a framework used to classify colleges and universities in the United States.[23] For doctorate-granting universities, the Carnegie Classification distinguishes specific universities as Highest Research Activity or High Research Activity based on various measures, such as research and development expenditures in science and engineering.[24] Universities categorized as Highest Research Activity are some of the most prestigious universities in the country. Data indicate racial disparities in the number of doctoral recipients from these Highest Research Activity universities. In 2017, almost 70% of doctoral graduates from Highest Research Activity universities were white and less than 4% were Black.[12, 24] This shows that a Black scientist is less likely to receive their doctorate from a prestigious university, which in turn can negatively affect their ability to secure or retain a faculty position and progress their career through promotions.

Another major hurdle facing prospective and current faculty from URGs is bias. Faculty members who are Black and/or from other URGs have shared stories of their experiences with microaggressions from colleagues and instances of implicit and explicit bias, from both individuals and institutions.[15, 25-27] These

[‡] NIH Scientific Workforce Diversity Actions and Progress: Narrowing the Funding Gap Progress Infographic

experiences can not only hinder the professional progress of faculty from URGs but also have serious consequences for their mental health and well-being. Additionally, the career progress of faculty from URGs can be impeded by the diversity tax, the additional burden of service to DEI efforts at an institution.[15, 26] Faculty from URGs are asked to mentor other students and faculty from URGs, serve on committees, lead trainings, and participate in many other obligations that detract focus from their own research and career progress. Overall, the lack of diversity in the scientific workforce perpetuates discriminatory behaviors in the workplace and places an undue burden on individuals from URGs to address these behaviors; the combination can have personal and professional repercussions.

The ACD WGD's Suggestions to Address Racism in the Scientific Workforce

Systemic racism is part of many aspects of life in the United States, including the scientific workforce. Institutions within the scientific workforce need to acknowledge that racism is an issue and take immediate action to address the many facets, such as bias, that contribute to it. Efforts to elicit individual- and institutional-level changes can help to create a better culture for current scientists from URGs—specifically Black scientists—and improve opportunities for future scientists who are Black and/or from other URGs.

Acknowledge Racism and Inequity and Provide Support to Black Members of the Scientific Community

Suggestions:

- Acknowledge the prevalence of racism and anti-Blackness in the scientific workforce
- Openly discuss the impact of systemic racism and inequity on Black scientists
- Present research with honest and precise language about racial and ethnic disparities
- Provide personal- and institutional-level support for Black members of the scientific community

The first major step that institutions and members of the scientific community can take to address racism in the scientific workforce is to acknowledge racism and anti-Blackness in science. The scientific community needs to appreciate the historical basis of racism and inequity and its impact on all aspects of Black life. White members of the scientific community need to recognize and communicate how systemic racism has benefitted their career progress as compared with that of their colleagues from URGs.[8] Acknowledging these benefits can be difficult, but this moment of racial reckoning requires white people to accept how racism and inequity are embedded in many systems, including the scientific environment.[28] Black individuals' experiences should not be devalued. Although the Black community in the United States has faced many hardships due to lack of equity, the dual pandemic of COVID-19 and violence against Black people has brought these problems to the fore and requires acknowledgment and change.

Members of the scientific community can acknowledge racism and inequity through their work and in their interactions with their Black colleagues. Researchers should be encouraged to report data on racial and ethnic disparities with honest and precise language. For example, the COVID-19 pandemic has disproportionately affected Black people for many reasons based on systemic racism and discrimination, such as housing segregation, job access, wealth disparities, and health care access.[5-7] Additionally,

members of the science community should openly discuss the dimensions of inequity and its impact on Black scientists, both in the scientific community and in their daily activities outside of work.

While they should openly recognize the issues of racism and inequity, members of the scientific community should also provide support to the Black members of the community. The events of the past year have exacerbated the emotional turmoil and feelings of hopelessness experienced by Black people. The COVID-19 pandemic has caused many personal, professional, and financial problems for members of the scientific community, particularly for historically Black colleges and universities (HBCUs) and junior faculty.[29] Junior faculty are attempting to determine what the future will be like at their institutions, how their research will be affected, and how to mentor their students during these uncertain times. In particular, Black and other faculty members from URGs often experience the diversity tax, which is the time-consuming requirement that these faculty serve on DEI committees, mentor colleagues and students from URGs, and participate in other DEI efforts.[15, 26] Although all of these efforts are important, they can sidetrack these faculty from their own research and career goals. In this time of addressing racial inequities, these faculty may feel an extra sense of obligation to do more or may question whether they are doing enough.

The scientific community should create new opportunities that can provide hope for faculty from URGs at HBCUs and other institutions who are dealing with the brunt of the physical, financial, and emotional strains caused by these uncertain times. One possibility is to require grant applicants to include URG mentoring, DEI committee representation, and other DEI experience in their biosketches. Subsequently, review criteria for grant applications should include efforts to support workforce diversity. This could be a way to track the impact of the diversity tax and create solutions to support these faculty. For example, there could be mechanisms that protect the time devoted to diversity efforts.

Conduct Research to Understand Systemic Racism in Research Studies and the Scientific Workforce

Suggestions:

- Research potential interventions to address systemic racism in research studies and the scientific workforce
- Leverage cross-disciplinary and community-based research to enhance the diversity of researchers and participants
- Increase funding for health disparity and community-based research
- Update funding applications to include criteria for external validity and best practices for enhancing diversity

Members of the scientific community should use their expertise to conduct research and evaluate interventions to monitor and address systemic racism and promote diversity in the scientific workforce and in research studies. This research should focus on interventions rather than describing the scope of the problem, which is already well known. Cross-disciplinary research can be used to define the problems, change the nature of research questions, and develop tools and training that challenge the fundamental notion of systemic racism. Community-based research can also be used to enhance the diversity of the researchers and the study participants. These studies should have strong external validity by incorporating the actual experiences and cultural understanding of the people who are being

studied. Additionally, this research should be led or informed by people with considerable experience working with URGs to further enhance its validity.

These studies should address the multiple effects of racism and inequity in research. Despite the inference that published research findings apply to all people, many studies do not involve Black or other participants from URGs, diminishing the external validity of these findings.[30] It is not necessary to have only investigators from URGs conduct research with participants from URGs. However, members of the scientific workforce should have the proper training to understand how biases can affect the quality of research. For example, researchers may use exclusion criteria in their research that are based on biases rather than scientific principles. Therefore, in addition to assessing and addressing racism at an individual and institutional level, this research should be used to understand its impact on the scientific process.

In order to begin assessing systemic racism in research, funding decisions should include criteria that ensure each study has strong external validity. NIH could increase funding for health disparity and community-based research. NIH could also create a funding opportunity announcement to evaluate the impact of institutional best practices for enhancing the diversity of their researchers, ranging from graduate students to senior faculty.

Monitor Acts of Racial Bias and Change the Culture Surrounding Diversity, Equity, and Inclusion

Suggestions:

- Identify institutional practices that bolster systemic racism and implement changes
- Monitor incidents of racial discrimination at institutions to ensure progress and lasting change
- Encourage scientific community members and others at NIH-funded institutions to report incidents of bias and mistreatment (via periodic climate surveys, real-time reporting, etc.)
- Implement targeted trainings and behavioral interventions to combat implicit bias
- Empower scientific community members to be allies to colleagues from URGs by actively combatting racial discrimination

Institutions within the scientific community, including NIH, vigorously respond to professional misconduct and harassment.[§] Acts of racial bias and discrimination should be addressed through equally vigorous systems. There is evidence that there are many instances of unintentional racial bias and some instances of deliberate racial bias in the scientific community.[15, 25-27] There should be processes to review institutions' structure, systems, and processes and policies that could be establishing or perpetuating discriminatory practices. Periodic climate surveys can be a particularly effective method for identifying problematic behaviors and practices and highlighting opportunities for intervention. Conducting climate surveys on a regular basis can ensure that the scientific community and others at NIH-funded institutions are actively working to improve their culture over time. There should also be efforts to encourage members of the scientific community and others at NIH-funded institutions to report problematic actions of bias and mistreatment, such as departmental actions that make people feel excluded, through real-time reporting. This reporting process could be anonymous and involve follow-up and evaluation to make sure the reported person is held accountable for their actions. NIH can consider

[§] NIH Anti-Sexual Harassment Statement

various possibilities to monitor racism at an institutional level, such as requiring periodic climate surveys at NIH-funded institutions and requesting data about reported acts of racial discrimination. As problematic structures, systems, processes, or policies are identified through climate surveys and reporting, institutions, including NIH, must clearly communicate to the community why these are problematic and contribute to systemic racism. Importantly, these claims should be supported with data.

To mitigate racial discrimination incidents, the scientific community needs to have a clear understanding of actions and behaviors that could be considered racist or discriminatory. Although training and workshops are effective ways to promote this understanding, a few things need to be considered. First, implicit bias is a major factor in discriminatory behavior, but it is not the only influence. There should be a focus on the interaction between individual-level implicit bias, individual-level explicit bias, and systemic and cultural factors that influence people's thoughts, behaviors, and actions, whether or not they are intentional. Bystander training may also serve to provide allies with tangible ways to address racial discrimination incidents. Although these trainings, particularly implicit bias training, can help raise awareness about problematic actions and behavior, they can have mixed results at promoting substantial change; they must be a part of a multifaceted approach to address racial discrimination and change social norms within the workforce.[31] There is evidence that complementary programs, such as mentorship programs, diversity task forces, and management training programs, help employees of all career levels become DEI advocates.[31] These institutional changes can help optimize the effectiveness of these trainings, promote inclusive behaviors, and make lasting changes in the scientific workforce.

Having a strong group of allies within the scientific community is key in supporting Black colleagues and creating change at institutions. Scientific community members who are committed to being allies may be better at listening to Black and other colleagues from URGs, looking for any behaviors or practices that may be racially discriminatory, and asking what can be done about systemic racism at their institutions. For example, these allies could help report instances of peers taking credit for others' work or incidents that impede the progress of Black colleagues. Similarly, faculty who are committed to being allies could address any performance disparities among their students from URGs and evaluate the demographic composition of students who are being trained in their laboratories. NIH and other institutions should create opportunities for allies to get involved in DEI initiatives and trainings, such as trainings on implicit bias, new policies or protocols, DEI-informed mentorship and sponsorship, and anti-racism. These trainings, when supplemented with other institutional changes, could empower allies and provide them with the tools and knowledge needed to actively combat racial discrimination. Such networks of allies can be vital for maintaining momentum and engagement to create change at their institutions.

Make Structural Changes to Mitigate the Impact of Racism and Implicit Bias in the Scientific Workforce

The ACD WGD recognizes that the implementation of programs and policies that use race, ethnicity, or other demographic variables for decision making may be challenging to implement under existing Supreme Court case law. However, NIH must implement targeted interventions to effectively "move the needle," and the ACD WGD encourages NIH to thoroughly explore what options are available.

Suggestions:

- Create and enhance training and career pathway programs that encourage students from URGs to pursue degrees and jobs in science, technology, engineering, and mathematics (STEM)
- Create incentives for institutions to enhance representation and diversity through training programs and community-based partnerships
- Implement trainings and standards for admissions and hiring committees to mitigate the impact of racism and implicit bias
- Create annual DEI reporting requirements for researchers and institutions funded by NIH

Acknowledging and committing to changing discriminatory behaviors are an important part of creating a more diverse, equitable, and inclusive scientific workforce; however, there also need to be structural changes to the recruitment, admission, retention, training, hiring, and funding processes. One way to combat racial discrimination in the scientific workforce is to enhance diversity and representation. Training and career pathway programs that target high school and college students from URGs, particularly from low-resource schools, can encourage students to pursue a career in science. These programs can include science competitions, community engagement initiatives, and research assistant training and hiring programs. There can also be concerted efforts to increase funding for existing training pathway programs for college students, particularly since the COVID-19 pandemic has affected opportunities to attend conferences or work in laboratories. Funding can also be used to incentivize institutions to partner with community organizations and schools with minimal resources or high populations of students from URGs to promote careers in science. Similar funding efforts should be made to support graduate and postdoctoral students from URGs. These students could receive funding to attend minority-serving conferences and professional meetings. There could also be funding for diversity-focused pre- and postdoctoral training programs administered by professional societies. This would allow for coherent and integrated support of trainees from URGs, including those trainees in fields that are essential for mitigating health disparities. Training programs managed by professional societies provide additional opportunities to mentor students and bring them together for enrichment activities.

The admissions and hiring processes are also important aspects that need to be reformed to comprehensively address racism in the scientific workforce. One obvious and important step is to diversify all admissions, hiring, and selection committees. Committees should reflect the demographics of the U.S. population whenever possible. There should also be a variety of representatives across the career trajectory, including students and junior faculty, who can provide diverse viewpoints. Before the review process, committees should create objective criteria for evaluating candidates. There should be a greater emphasis placed on statements of interest, publications and first authorships, and letters of recommendation than on test scores, journal impact factors, or institution of training.

During the review process, these committees should use objective DEI-informed criteria to identify a large pool of qualified individuals rather than selecting a small number of the “top” candidates. Limiting the selection to the “top” candidates can introduce biases about candidates from URGs, such as where they went to school. If the selection process is limited by the number of awards or fellowships, the committee should be trained in how to evaluate candidates in a way that reduces the consideration of factors that are known to enhance racial bias. Committee members should also be educated on how to mitigate bias through implicit bias training and training focused on using objective criteria rather than

subjective assessments. Another component of training could be highlighting successful researchers from URGs. Even if the education or career path of these example researchers is not ideal, committees' exposure to these researchers could potentially expand the committees' viewpoints on what successful candidates can look like.

Committees should also consider how candidates could contribute to the institution's diversity mission. For example, a faculty or grant application should include diversity questions to allow the committee to assess whether that applicant can serve as a role model for URGs or has experience implementing initiatives to support students and faculty from URGs. The goal of setting these standards for admission and hiring committees is to stop reinforcing a biased process that continually reproduces itself by selecting candidates who reflect the characteristics or networks of the committee members and excluding candidates who are outside of that system. Another potential strategy is for institutions to implement cluster hiring practices, which have been shown to enhance diversity.[32] A similar cluster admission strategy could be used for undergraduate and graduate admissions. Students from URGs would benefit from having a cohort of peers for support and a mentor assigned to the cohort to enhance both retention and academic performance. Institutions should also focus on increasing the number of Black faculty in positions of leadership and not just in diversity offices. Institutions should set diversity targets for students and faculty and track progress over time to assess the impact of these interventions.

Finally, in order to facilitate progress in DEI within the scientific community, NIH could require annual DEI reporting requirements for principal investigators and institutions that have received NIH funding. The required elements for these reporting requirements could include diversity recruitment efforts and their success rates, the percentage of faculty who are Black and/or from other URGs, descriptions of URG mentorship and sponsorship programs, efforts to promote faculty members who are Black and/or from other URGs, and the results of racial climate surveys. NIH could also require institutions to submit information on any reported acts of racial discrimination and how these situations were handled. Requesting this type of information will demonstrate that NIH strongly values DEI and is monitoring NIH-funded institutions' commitment to these values. This will ultimately incentivize institutions to commit to combatting racial discrimination, enhancing diversity, and improving the culture at their institutions.

Conclusions

Although racism has been deeply embedded in the structural and social fabric of the United States, the COVID-19 pandemic and events of police brutality against Black people have exposed the inequities that have disadvantaged Black people for many years. These events have been extremely tragic, but many people and institutions are using this moment of racial reckoning to assess their contributions to systemic racism and make meaningful changes. The scientific workforce has struggled with racial discrimination and inequity in many facets of the field, including training, recruiting, hiring, retention, funding, and supporting career development.

This summary of perspectives from the ACD WGD highlights the areas that need improvement and suggests specific interventions that can instill lasting change. Individuals and institutions need to acknowledge racism and inequity within the scientific workforce and support its Black members. Evidence-based research should be conducted to find strong interventions that can promote change. Additionally, reporting and training measures should be adopted across the workforce in order to create

and empower allies who support their Black colleagues and combat racial discrimination. There should also be institutional changes in recruitment, hiring, admission, training, and funding processes in order to enhance diversity in student and faculty populations. These efforts will promote individual- and institutional-level change that will create more inclusive and safe environments for Black scientists at all career levels.

As a leader and funder of the scientific workforce, NIH is in the unique position to induce systemic and cultural change. NIH can lead by example as well as institute new initiatives and policies to address racism and inequity in the scientific workforce. While there are clearly structural changes that need to happen at institutions, there also need to be focused efforts on promoting change among individual members of the scientific workforce. The ACD WGD's suggestions and efforts by NIH should be adopted and implemented quickly to leverage the current momentum of racial reckoning. In this way, NIH will demonstrate its unwavering commitment to supporting Black scientists.

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